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EXAMINER

PALABRICA, RICARDO J

ART UNIT PAPER NUMBER

3641

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/014,619

Applicant(s)

FRATTINI ET AL.

Examiner

Rick Palabrica

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) 23, 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21, 22, 24-26, and 29-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's 1/19/05 Amendment, which directly amends claims 21, 23, 30, 34, 37 and 40, and submits a declaration and formal drawings, is acknowledged. This amendment is in response to the 7/20/04 Office Action.

2. Applicant amends claims 21 and 23 in an attempt to address the withdrawal of claims to a non-elected species. Claim 23 is still directed to a non-elected species, e.g., such as that shown in Fig. 6, because of the recitation of a base plate that is for attachment to the floor. Accordingly, claim 23 remains withdrawn from consideration in this Office Action.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 21, 22, 24-26, and 29-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete because several structural limitations are defined in terms of various unknowns. Thus, the metes and bounds of the claims cannot be determined.

Claims 21 and 37 recite the limitation of a housing with "a length at least as long as the irradiated nuclear fuel assembly." Underlining provided. The irradiated fuel

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assembly is recited in the preambles of the claims as part of an intended or desired use clause. There is not a unique length of an irradiated fuel assembly because there is a plurality of types of fuel assemblies (e.g., for PWRs, BWRs, CANDU, fast reactors and gas-cooled reactors). Furthermore, even fuel assemblies of one type, e.g., BWR, come in more than one length, i.e., short and long varieties.

Claim 31 and 37 recite the limitation of a plurality of ultrasonic transducers that "each produce omnidirectional ultrasonic energy waves having a node structure that is an approximate multiple of said spacing between each of said fuel rods." Underlining provided. The irradiated fuel assembly is recited in the preambles of the claims as part of an intended or desired use clause, and the spacing of fuel rods is a property of said fuel assembly." There is not one unique spacing of fuel rods for all types of fuel assemblies. In fact, even for a single type of fuel assembly, e.g., a PWR, the spacing between fuel rods varies depending on the number of fuel rods per fuel assembly.

Claim 34 recites the limitation of at least a first one of a plurality of ultrasonic transducers that is "adjacent to a first one of said four sides of said irradiated nuclear fuel assembly ..." Underlining provided. The irradiated fuel assembly is recited in the preamble as part of an intended or desired use clause. Not all irradiated fuel assemblies have so-called "sides". Some fuel assemblies do not have sides because they have circular cross sections (see, for example, Jenssen (U.S. 3,368,946) or JP 7-120578).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21, 22, 24, 29, 31, 32, and 37-39 rejected under 35 U.S.C. 102(b) as being anticipated by Fiorenzo et al. (EP 0418722 A1).

Fiorenzo et al. disclose an apparatus for ultrasonic decontamination for radioactive metal material (see col. 1, lines 1+ and Fig.). They show: a) an elongated housing 5B having an opening to receive large sized contaminated surfaces; b) a plurality of ultrasonic transducers 13 that produce ultrasonic waves and positioned on said housing.

Applicant himself and the Declarant admit that the transducer energy for omnidirectional transducers is expressed in W/l or W/gal (see Remarks on page 12 of Amendment and item d), page 4 of the Declaration).

Fiorenzo et al. disclose that their assembly of transducers 13, are of such specification and number to produce a homogeneous power density of 25 watts per liter (W/l) in tank 5B (see col. 2, lines 40+). Based on Fiorenzo et al.'s statement and the admission of the Applicant and Declarant, transducers 13 are omnidirectional ultrasonic transducers.

The claims are replete with a statement of intended or desired use, e.g., "for cleaning an irradiated nuclear fuel assembly." This clause, as well as other statements

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of intended use do not serve to patentably distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does."  
Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The system in the cited reference is capable of being used in the same manner and for the intended or desired use as the claimed invention.

As to the limitation in the claims regarding the length of the housing, absent the definition or specification of said length, the housing of Fiorenzo et al. reads on said claims. Also, there are short BWR fuel assemblies that could easily fit inside tank 5B of Fiorenzo et al.'s system.

As to the limitation in the claims regarding the node structure of the ultrasonic waves, absent the definition or specification of the spacing between fuel rods, the omnidirectional waves produced by the transducers of Fiorenzo et al. read on said claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fiorenzo et al. in view of Walter et al. (U.S. 5,200,666). Fiorenzo et al. disclose the Applicant's claim except for the specifics of the transducer.

Walter et al. teach in Fig. 1 a transducer comprising an elongated rod having a length that is an integral multiple of  $\frac{1}{2}$  a predetermined wavelength (see column 1, lines 54+). They also teach that their invention can emit twice the amount of ultrasonic energy compared to other transducers with the same geometric dimensions (see column 2, lines 1+). Applicant incorporates Walter et al.'s patent and their Fig. 1 is almost identical to applicant's Fig. 2.

One having ordinary skill in the art at the time of the invention would have recognized that both references are in the same field of endeavor, i.e., ultrasonic generators for ultrasonic cleaning. It would also have been obvious to such artisan to use in the system, as disclosed by Fiorenzo et al., the omnidirectional transducers taught by Walter et al., to gain the advantages thereof (i.e., more effective and efficient ultrasonic wave generation), because such modification is no more than the use of well known expedients within the art.

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5. Claims 30, 33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fiorenzo et al. in view of the combination of Kato et al. (U.S. 5,467,791) and Richardson et al. (U.S. 5,377,237). Fiorenzo et al. disclose the Applicant's claim except for the reflector.

Kato et al. teach an ultrasonic cleaning device for a nuclear fuel assembly (see Abstract and Figs. 1-12). They further teach the use of a reflector 131 around the housing 127 of the apparatus to prevent leakage of ultrasonic waves (see col. 10, lines 25+).

Richardson et al. teach a method and apparatus for ultrasonic inspection of a tube component of a nuclear reactor (see col. 1, lines 1+, and Fig. 2). They utilize an air gap as an efficient reflector of ultrasound (see col. 2, lines 64+). They further teach how to create this air gap by a mechanical seal 20 (see col. 2, lines 60+ and Fig. 2).

One having ordinary skill in the art at the time of the invention would have recognized that all three references are in the same field of endeavor, i.e., application of ultrasonics. It would also have been obvious to such artisan to use with the system, as disclosed by Fiorenzo et al., an inner reflector around the housing, by the teaching of Kato et al., to gain the advantage thereof, e.g., reduce leakage of ultrasonic waves, and further an air gap around said inner reflector, by the teaching Richardson et al., to further gain the advantage thereof, e.g., further reduce wave leakage, because such modifications are no more than the use of well known expedients within the art.

As to the outer reflector, this is inherent in the resulting Fiorenzo-Kato et al.-Richardson et al. combination because said outer reflector must be present to have an

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air gap around the inner reflector. As to the geometry of the reflector system, this is obvious to an artisan.

6. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fiorenzo et al. in view of the combination of Scharton et al. (U.S. 4,320,528), Kato et al. (U.S. 5,467,791) and Richardson et al. (U.S. 5,377,237). Fiorenzo et al. disclose the Applicant's claim except for disposition of transducers on four sides of a fuel assembly and the reflector.

Fiorenzo discloses an assembly of transducers of such number as to maintain in the inner tank 5A a homogeneous power density of 25 W/l. It is inherent that at least four such assembly of transducers, evenly spaced from each other around the periphery of the tank, are required to produce such homogeneity.

Scharton et al. teaches an ultrasonic cleaning apparatus for a nuclear component that can be placed either inside the housing (see Fig. 4) or outside the housing (see Fig. 6).

See section 5 for the teachings of Kato et al. and Richardson on the reflector with air gap.

One having ordinary skill in the art at the time of the invention would have recognized that all references are in the same field of endeavor, i.e., application of ultrasonics. It would also have been obvious to such artisan to place the transducers inside the housing, i.e., on tank 5A (and be adjacent to an irradiated fuel assembly being cleaned), by the teaching of Scharton et al., and to further use with the resulting

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system, an inner reflector around the housing, by the teaching of Kato et al., to gain the advantage thereof, e.g., reduce leakage of ultrasonic waves, and further an air gap around said inner reflector, by the teaching Richardson et al., to further gain the advantage thereof, e.g., further reduce wave leakage, because such modifications are no more than the use of well known expedients within the art.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:30-5:00, Mon-Thurs..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJP  
May 3, 2005

